

EVALUATION OF THE FINANCIAL HEALTH OF FOOD RETAIL OUTLETS IN A MARKET ENVIRONMENT. A CASE STUDY FROM THE SLOVAK REPUBLIC

Lenka Hudáková Stašová¹

¹ Technical University of Košice, Faculty of Economics, Department of Finance, Slovakia, ORCID: 0000-0002-4392-4233, lenka.hudakova.stasova@tuke.sk.

Abstract: In this paper, food retail stores are evaluated. The aim of the survey is analysis of their financial health using appropriate statistical methods, to analyse the market position of businesses, to identify weaknesses in businesses that may contribute to a poor financial situation, to compare the results obtained and to submit proposals to improve the current financial health of businesses. The analysed sample is made up of a selection of 50 Slovak businesses. The companies operate in the same economic and political system, with similar monetary, customs, tax policy from the government. 4 ratio-based financial analysis indicators were selected as representative (return of assets, return of sales, debt ratio, equity ratio). Multicriterial evaluation methods were used to research the position of businesses on the market (the simple unweighted rank method, the fictional point method, the standardized variable method, the scoring method). We showed the correlations of the methods using Spearman's rank correlation coefficient. We found the highest correlation in values between the scoring method and the distance from the fictional point method. However, in all cases, by statistical calculation, we found that there is a strong statistically proven relationship between all the methods used. The degree of indebtedness of a business significantly affects its financial health and the structure of the finances. The lowest value for the debt ratio in the monitored sample of businesses is 12.5%. In the group of the worst performing companies, the debt ratio climbed far above the recommended values of 50–70%. The extreme value was a debt ratio as high as 106.3%. We consider the proposals we present to be universal, applicable in other countries in the given sector.

Keywords: Multicriterial evaluation methods, food retail stores, market position.

JEL Classification: M21.

APA Style Citation: Hudáková Stašová, L. (2022). Evaluation of the Financial Health of Food Retail Outlets in a Market Environment. A Case Study from the Slovak Republic. *E&M Economics and Management*, 25(3), 122–141. <https://doi.org/10.15240/tul/001/2022-3-008>

Introduction

Identifying the optimal location for a business in a market environment depends on the quality and availability of up-to-date information on comparable businesses, maintaining the conditions of comparability, selection of indicators and the methods of analysis of the financial and economic position of the business in the space.

In this paper, food retail stores are evaluated. We have focused on this type of organization, because they are also of some importance for people from smaller towns, especially villages where there is only 1 store. In the event of its closure, residents are dependent on travelling to larger cities. Doing business in food retail is not as easy as it seems. With the arrival of retail chains, there was a significant reversal in

consumer purchasing behaviour. People began preferring cheaper and lower-quality food. Today, the situation has changed and a growing number of consumers also place emphasis on the quality of food sold. They pay for quality and safe food.

The reason for the analysis of retail food outlets is to discover how the financial situation of small traders will develop and what opportunity they have to survive compared to large competing chains. With increasing competition, only those who constantly follow trends, improve their offers and bring added value to customers can succeed. The aim of the paper is to analyse the position of businesses on the market, to identify weaknesses of businesses that may contribute to a poor financial situation and to submit proposals to improve the current financial health of businesses.

When comparing businesses, we use proven multicriterial evaluation methods that synthesize several characteristics into a single integrated indicator. A suitable combination of mathematical and statistical methods can create a real detailed picture of the position of the business in space. We have complied with the conditions of comparability in the intercompany comparison: material conditions (macroeconomic framework of the business, area of activity), formal conditions (same design of indicators, same balance sheet policy), time conditions (same period, same length of period), size conditions (same size of businesses).

1. Literature Review

Every economic sector, every single industry, every economy, and even every firm has its specific financial structure. At the same time, the formation and optimization of the financial structure is influenced by a myriad of diverse factors that financial managers should take into account in their decisions (Růčková & Škuláňová, 2021).

Business entities strive for continuous adaptation to changing situations and needs. The decisions of business entities entangled in multifaceted processes of economic, social, and environmental progress must be taken on the basis of reliable knowledge. In such a situation, the measurement of financial efficiency in terms of the profitability is extremely desired and provides valuable information on the necessary modifications to reduce the potential risks of business operation (Zielińska-Chmielewska et al., 2021, 2022).

In recent decades, predicting company bankruptcies and financial troubles has become a major concern for various stakeholders. Furthermore, because financially sustainable businesses are affected by numerous highly complex factors, both internal and external, the situation is even more complex (Srebro, 2021).

With the continuous development of the market economy, competition in the industry is becoming more and fiercer, leading to the financial situation of many companies are in trouble. Financial risk analysis plays an important role in helping companies to develop smoothly (Wang et al., 2021).

Financial analysis helps companies identify their financial strengths and evaluate their performance, which benefits decision-making within the organization (Buele et al., 2021).

It is important to optimize economic results, otherwise the company's financial stability, financial health and competitiveness will be endangered in the long run (Svatošová, 2021, 2022).

Regarding the new competition, it is essential for companies in each sector to know their financial structure. It is the financial situation that provides an overall characteristic of the company, which enables to correctly select resources to finance needs, and to allocate the obtained resources to particular items of the property. Optimization of the financial structure in food trade industry companies should bring a new view of a rational composition of company's equity and liabilities (Majernik et al., 2020). It is important to start from improving the financial management level of the enterprise, so as to reveal the potential financial risks of the enterprise, and timely prevent the financial crisis of the enterprise from the source, and timely solve hot issues (Wang et al., 2021). Financial data has gradually become important indicators to measure the value of enterprises (Han, 2021).

The issue of predicting the financial health of companies is very important in terms of their sustainability (Horváthová et al., 2021). Indebtedness indicators are used to monitor the structure of corporate financial resources. The company's share of its own and foreign resources affects the financial stability of the company. A high share of own resources makes the company stable, and independent. With a low share, on the contrary, the company is unstable, market fluctuations and credit

uncertainty can have serious consequences. However, foreign capital is cheaper, and too high indebtedness ratios can jeopardize the existence of enterprises (Valaskova et al., 2021).

There is a positive association between financial leverage and firm failure, whereas the current ratio and the return on assets are negatively connected with corporate bankruptcy (Tarighi, 2022). Knowing the relationship between return on assets and total indebtedness of companies allows for more effective business management. Knowledge of coefficients and thresholds for individual industries can be used to optimize the debt policy of the company in the industry (Jencova et al., 2021). The operating leverage or cost structure, in addition to affecting profitability, also affects the relationship between that profitability and other sources of risk that depend on the country in which the company operates. More specifically, indebtedness, size, innovation specificity and reputation all affect profitability to a greater or lesser extent, depending on the level of operating leverage of the company (Grau & Reig, 2021).

Analysis of a business's financial health helps to reveal whether the business is sufficiently profitable, has an appropriate capital structure, asset efficiency, liquidity and many other facts. Using this analysis, businesses try to prevent future adverse developments (Knápková & Pavelková, 2017).

The financial stability of the business is dependent on whether the company is financed by its own or outside capital. Debt indicators monitor the structure of this capital. The larger the proportion of its own capital a business uses, the greater its stability. If the proportion of own capital is low, the business is unstable and this may concern creditors, having a negative impact (Zalai, 2016).

Debt indicators serve businesses to monitor the structure of their finances, they also express the share between own and outside finances. If a business uses its own capital to a high degree, the business is stable and independent. A low proportion of own capital can cause fluctuations in the market and the state of the business is uncertain. On the other hand, a high proportion of outside capital can help the profitability of the business, but it can also result in the disturbance of the financial stability of the business (Penner, 2016; Jenčová, 2016).

The debt ratio is a basic financial indicator for entrepreneurs, which indicates the share between total debt and total assets. The recommended value range is from 30–60% (Orešský & Rehák, 2019).

The equity ratio is often described as financial independence. This indicator provides us with information about the amount of coverage of assets by outside capital. It also expresses the level of financing of assets from the company's own capital (May, 2008).

In most cases, statistical research focuses on analysing only one observed statistical indicator and only one property in the research sample. In many cases, however, this is not enough, and it is necessary to examine several aspects of the statistical sample, taking into account the manifestations of its multiple characteristics, depicted by several statistical properties (Hair et al., 2009). In such an analysis, it is necessary to use multidimensional statistical methods, which include, among others, simple methods of multicriterial comparison, namely the rank sum test, assignment of points method, standardized variables and the distance from the fictional point method (Hurbánková, 2020).

In today's increasingly competitive markets, it is essential to be able to determine the position of food retail companies compared to their competitors (Fenyves & Tarnóczy, 2020). Innovations aimed at building customer relationships, community membership and industry alliances also contribute to the financial performance of food retailers (Alt et al., 2020).

Based on the above, based on the need to know the financial health of the company, to know the possibilities to succeed in a highly competitive environment, we decided to evaluate the position of specifically retail food stores in the market.

2. Materials and Methods

For intercompany comparisons, you need to get the right information. In order to evaluate the position of the business in its sector as a whole, we need statistically processed results of a representative sample of businesses with similar business structures. Conversely, if we want to compare a company only with its most important competitors, we draw the necessary information from their financial statements. Such a process is more time consuming. We choose the second approach in this paper.

The subject of the survey in this paper is analysis of the financial health of organizations engaged in food retailing. The analysed sample is made up of a selection of 50 Slovak businesses. The data base is created not only from freely available sources that businesses are required to publish, but also from annual reports and websites. The selection of businesses was aimed at businesses with predetermined criteria:

- Business area: food retail, other food retail, non-specialised retail;
- Legal form: limited liability company, cooperative;
- Size: 10–2,000 employees;
- Financial statements: financial statements, annual reports from 2021 and 2020.

We selected companies by random selection from the overall list of entrepreneurs in food retail in the Slovak Republic so that companies in all eight regions of the Slovak Republic are evenly represented. The area of business is food retail, other food retail and non-specialized retail.

The companies we compare operate in the same economic and political system, with similar monetary, customs, tax policy from the government. Their business activities have comparable characteristics (circle of customers, scope of business, etc). We evaluate businesses on the basis of identically constructed indicators which use values from comparable financial statements.

To assess the financial health of the selected group of businesses, we have selected the following financial indicators:

- ROA – return on assets;
- ROS – return on sales;
- ER – equity ratio – financial independence;
- DR – debt ratio – indebtedness.

We chose these indicators because multicriteria methods of comparing companies consist in choosing the most important indicators of financial and economic analysis, which reliably represent the financial situation. Based on the selected indicators, the analysis should provide a comprehensive view of the level of companies through one synthesized indicator. One of the goals of companies is to make a profit through their activities. Profitability indicators make it possible to determine whether a company is economically efficient. Return on assets gives an idea of how well a company can turn the money it invests into net income. The

higher the ROA value, the better the company earns on smaller investments. Profitability of sales speaks not only about the efficiency of production and service delivery, but also about how management manages the business. The debt ratio gives a understanding of the stability and independence of the company in the case of a high share of own resources and, conversely, of instability, when foreign resources predominate. Financial independence interprets the share of own resources in assets. Although foreign capital is cheaper, too large a share can jeopardize a company's existence.

Return on assets (ROA) measures the overall efficiency of a business. The total profit after tax and interest paid for the use of outside capital gives the effect of appreciation. The return on assets also takes into account that the effect of appreciation for borrowing capital is remuneration to the owners of the business, including its creditors. Creditor's interest is also 'adjusted' for income tax. The higher the value of the return on assets indicator, the more the company was able to earn from each €1 of assets. The average value of this indicator for the whole Slovakia is 1.89%.

$$ROA = \frac{\text{net profit} + \text{interest} (1 - \text{tax})}{\text{Total assets}} \quad (1)$$

Return on sales (ROS) is a ratio used to assess the operational efficiency of a business. It shows how much profit is generated from €1 of sales. Usually, the value should be around 10%.

$$ROS = \frac{\text{net profit}}{\text{sales}} \quad (2)$$

The total debt ratio is an indicator of creditor risk. The higher the value of the indicator, the higher the risk for creditors. While respecting the golden rule of financing, the recommended value should not exceed 50% (it should be 30–50%). However, the value of this indicator may also be accepted in certain circumstances with an interval of 70–80%.

$$\text{Debt ratio} = \frac{\text{liabilities}}{\text{assets}} * 100(\%) \quad (3)$$

Financial independence (equity ratio) indicates the extent of use of equity in relation to the total assets of the business. It should not fall below 30%, and not even exceptionally below 20%. The sum of the values of the debt ratio and equity ratio is equal to 100%.

$$Equity\ ratio = \frac{equity}{assets} * 100(\%) \quad (4)$$

The aim of this paper is to analyse the financial health of food retail businesses using appropriate mathematical and statistical methods, to analyse the market position of businesses, to identify weaknesses in businesses that may contribute to a poor financial situation, to compare the results obtained and to submit proposals to improve the current financial health of businesses. The reason for the analysis of retail food stores is to find out how the financial situation of small retailers is developing and how they have the opportunity to survive compared to large competing chains.

Research questions:

RQ1: How do food retail businesses prosper?

RQ2: Do all multicriterial evaluation methods lead to the same results?

RQ3: Does the degree of debt of the business affect its financial health?

RQ4: Are financially dependent businesses one of the worst businesses in the industry?

Hypotheses:

H1: Businesses with a low equity ratio are in the bottom ten of the evaluated set of businesses.

H2: Businesses with high indebtedness are in the bottom ten in the evaluated set of businesses.

Multicriterial evaluation methods were used to research the position of businesses on the market. The simple unweighted rank method is characterized by the selection of individual criteria (indicators). The best value for a criterion is rated 1, the second best 2, etc. All selected criteria will be evaluated in this way. The next step is the final addition of the order and the averages are calculated. The criterion with the lowest average total is rated as the best. However, the method does not take into account the weights/significance of the criteria, which can be described as a significant disadvantage. When sorting, it also leaves aside the depth of differences between rankings, for example, whether the difference between two items is 3 or 10 units is insignificant.

The disadvantages of the simple unweighted rank method are eliminated by the scoring method. The advantage of this method is to take into account the quantitative differences of indicators and determine their percentages.

The best value is assigned 100%, the worst 0%. The calculation distinguishes between the indicators that a business seeks to maximize and the ones it minimizes.

$$b_{ij}max = \frac{x_{ij}}{x_{max}} * 100 \quad (5)$$

$$b_{ij}min = \frac{x_{min}}{x_{ij}} * 100 \quad (6)$$

The values obtained for $b_{ij}min$ and $b_{ij}max$ are divided by the number of indicators and a ranking is created from the highest to the lowest values. The disadvantage of the method is excessive sensitivity to extreme changes in indicators.

Another method is the fictional point method. The fictional point is considered to be the option that achieves the best or predetermined values in terms of all indicators. Benefits grow linearly as the values of benefit indicators grow, while as cost-type indicators increase, they decrease degeneratively. The resulting values of each option are compared with the corresponding values for the fictional point. The most satisfactory value of the j -th indicator in the fictional point is $y_j^{(b)}$. The utility functions of the indicator, which we maximize and minimize, are determined by the relationship:

$$u_{ij}(MAX) = \frac{y_{ij}}{y_j^{(b)}} \quad (7)$$

$$u_{ij}(MIN) = \frac{y_j^{(b)}}{y_{ij}} \quad (8)$$

for which it holds that $i = 1, 2, \dots, m; j = 1, 2, \dots, n$. For fictional points, we add aggregated utility functions and sort them according to their values. The method cannot be used if one of the fictional points has a zero value.

Standardized variables are used for indicators expressed in different units of measurement and which are different by an order of magnitude. The original form of the indicator is transformed into a standardized form, quantified by a dimensionless number. For each indicator, the average, variance and standard deviation is calculated. Indicators which it is desirable to minimize are calculated as the difference between the average and the original value and divided by the standard deviation. The standard value is still divided by the number of indicators, and the ranking is

determined by the highest recorded value – the best rating 100, worst 0.

The distance from a fictional point method is based on the creation of an optimal (fictional) structure, where we allocate a minimum value to all the indicators that we minimize and a maximum value to those we maximize. For each optimal item, the average distance is calculated, most often using Euclidean geometry.

$$d_{ij} = \sqrt{\frac{1}{m} \sum_j^m (u_{ij} - u_{0j})^2} \quad (9)$$

We determine the final order of items so that the best item with order 1 will be the one that has the smallest distance from the fictional point, the worst with the order m will be the one that has the highest distance from the fictional point.

The aim of all multicriterial evaluation methods is to transform and synthesize the values of different indicators into one integral indicator, comprehensively expressing the level

of individual businesses in the set of values examined.

To compare the correlation, Spearman's rank correlation coefficient was calculated.

MS Excel and SPSS statistical software were used for data collection and statistical analysis.

3. Results and Discussion

When comparing companies in space, companies from the same industry are available for comparison. The aim of all methods of multicriteria evaluation is to transform and synthesize the values of various indicators into a single – integral indicator, comprehensively expressing the level of individual companies in the set of surveyed values.

For the purposes of the analysis, four representative indicators were selected: return on assets (ROA), return on sales (ROS), equity ratio (ER), debt ratio (DR), and their values for all the businesses analysed are shown in Tab. 1.

Tab. 1: Financial ratios – Part 1

| Business | ROA | ROS | ER | DR | Xroa-Xpr. | (Xroa-Xpr.) ² |
|----------|----------|----------|----------|----------|-----------|--------------------------|
| 1 | 0.743339 | 0.046016 | 0.317992 | 0.682008 | 0.6795 | 0.461721 |
| 2 | -0.02749 | -0.18167 | 0.042194 | 0.957806 | -0.09133 | 0.008341 |
| 3 | 0.10024 | 0.05109 | 0.342964 | 0.657036 | 0.36401 | 0.001325 |
| 4 | 0.029386 | 0.011927 | 0.360767 | 0.639233 | -0.03445 | 0.001187 |
| 5 | 0.308544 | 0.09998 | 0.396312 | 0.603688 | 0.244705 | 0.059881 |
| 6 | 0.183565 | 0.112209 | 0.383423 | 0.616577 | 0.119726 | 0.014334 |
| 7 | -0.0136 | -0.02282 | 0.123374 | 0.876626 | -0.07743 | 0.005996 |
| 8 | 0.106286 | 0.085558 | 0.243032 | 0.756968 | 0.042447 | 0.001802 |
| 9 | -0.47754 | -0.18048 | 0.058989 | 0.941011 | -0.54138 | 0.293096 |
| 10 | 0.061499 | 0.011745 | 0.262425 | 0.737575 | -0.00234 | 5.47E-06 |
| 11 | 0.012378 | 0.007596 | 0.680276 | 0.319724 | -0.05146 | 0.002648 |
| 12 | -0.29689 | -0.09254 | 0.063104 | 0.936896 | -0.36073 | 0.130123 |
| 13 | -0.02872 | -0.01488 | 0.144587 | 0.855413 | -0.09256 | 0.008567 |
| 14 | 0.415732 | 0.047912 | 0.427435 | 0.572565 | 0.351893 | 0.123829 |
| 15 | 0.053324 | 0.013188 | 0.074782 | 0.925218 | -0.01051 | 0.000111 |
| 16 | -0.00922 | -0.02517 | 0.007424 | 0.992576 | -0.07306 | 0.005337 |
| 17 | -1.19198 | -0.09523 | -0.06324 | 1.063241 | -1.25582 | 1.577085 |
| 18 | -0.06378 | -0.04874 | 0.047031 | 0.952969 | -0.12761 | 0.016285 |

Tab. 1: Financial ratios – Part 2

| Business | ROA | ROS | ER | DR | Xroa-Xpr. | (Xroa-Xpr.) ² |
|----------|----------|----------|----------|----------|-----------|--------------------------|
| 19 | -0.03628 | -0.04043 | 0.037873 | 0.962127 | -0.10011 | 0.010023 |
| 20 | 0.027943 | 0.140132 | 0.785097 | 0.214903 | -0.0359 | 0.001289 |
| 21 | 0.157711 | 0.094635 | 0.154647 | 0.845353 | 0.093872 | 0.008812 |
| 22 | 0.027194 | 0.011583 | 0.075167 | 0.924833 | -0.03665 | 0.001343 |
| 23 | 0.005533 | 0.00182 | 0.021224 | 0.978776 | -0.05831 | 0.0034 |
| 24 | 0.14456 | 0.081265 | 0.874772 | 0.125228 | 0.080722 | 0.006516 |
| 25 | 0.011457 | 0.012815 | 0.396504 | 0.603496 | -0.05238 | 0.002744 |
| 26 | 0.028812 | 0.04943 | 0.170672 | 0.829328 | -0.03503 | 0.001227 |
| 27 | -0.05133 | -0.03196 | 0.118172 | 0.881828 | -0.11516 | 0.013263 |
| 28 | 0.044201 | 0.011748 | 0.686001 | 0.313999 | -0.01964 | 0.000386 |
| 29 | -0.06781 | -0.15535 | 0.330735 | 0.669265 | -0.13165 | 0.017333 |
| 30 | 0.061383 | 0.018561 | 0.390925 | 0.609075 | -0.00246 | 6.03E-06 |
| 31 | 0.298271 | 0.045851 | 0.086201 | 0.913799 | 0.234432 | 0.054958 |
| 32 | 0.025699 | 0.044856 | 0.358484 | 0.641516 | -0.03814 | 0.001455 |
| 33 | 0.025885 | 0.00996 | 0.316038 | 0.683962 | -0.03795 | 0.00144 |
| 34 | 0.393682 | 0.042576 | 0.171949 | 0.828051 | 0.329843 | 0.108796 |
| 35 | 0.037566 | 0.008816 | 0.361508 | 0.638492 | -0.02627 | 0.00069 |
| 36 | 0.515521 | 0.008029 | 0.09949 | 0.90051 | 0.451683 | 0.204017 |
| 37 | 0.108314 | 0.11035 | 0.15341 | 0.84659 | 0.044476 | 0.001978 |
| 38 | 0.013564 | 0.009617 | 0.800586 | 0.199414 | -0.05027 | 0.002528 |
| 39 | -0.02874 | -0.18485 | 0.343268 | 0.656732 | -0.09258 | 0.00857 |
| 40 | 0.101902 | 0.065228 | 0.243749 | 0.756251 | 0.038063 | 0.001449 |
| 41 | 0.009721 | 0.002329 | 0.399099 | 0.600901 | -0.05412 | 0.002929 |
| 42 | 0.120472 | 0.034457 | 0.837756 | 0.162244 | 0.056633 | 0.003207 |
| 43 | -0.02262 | -0.1805 | 0.277258 | 0.722742 | -0.08646 | 0.007475 |
| 44 | 0.295997 | 0.154221 | 0.153487 | 0.846513 | 0.232159 | 0.053898 |
| 45 | 0.024647 | 0.01311 | 0.211166 | 0.788834 | -0.03919 | 0.001536 |
| 46 | 0.646465 | 0.124674 | 0.103981 | 0.896019 | 0.582626 | 0.339453 |
| 47 | -0.03446 | -0.19466 | 0.329909 | 0.670091 | -0.09829 | 0.009662 |
| 48 | 0.305152 | 0.142954 | 0.356459 | 0.643541 | 0.241314 | 0.058232 |
| 49 | -0.01756 | -0.02093 | 0.418216 | 0.581784 | -0.0814 | 0.006625 |
| 50 | 0.113985 | 0.142188 | 0.179204 | 0.820796 | 0.050146 | 0.002515 |

Source: own

Tab. 2: Summary statistics

| | DR | ER | ROA | ROS |
|---------------------|----------|----------|----------|-----------|
| Count | 50 | 50 | 50 | 50 |
| Average | 0.716882 | 0.283118 | 0.063839 | 0.007965 |
| Median | 0.746913 | 0.253087 | 0.028377 | 0.011837 |
| Std. deviation | 0.224924 | 0.227208 | 0.272907 | 0.089848 |
| Coeff. of variation | 31.69% | 80.25% | 427.49% | 1,128.11% |
| Standard error | 0.175312 | 0.032132 | 0.038595 | 0.012707 |
| Minimum | 0.125228 | -0.06324 | -1.19198 | -0.19466 |
| Maximum | 1.063241 | 0.874772 | 0.743339 | 0.154221 |
| Range | 0.050591 | 0.938013 | 1.93532 | 0.348876 |
| Skewness | -2.44611 | 1.05394 | -1.5256 | -0.75023 |
| Std. skewness | -7.06131 | 3.04247 | -4.40403 | -2.16571 |
| Kurtosis | 7.31803 | 0.750743 | 9.29078 | 0.306358 |
| Std. kurtosis | 1.5627 | 1.0836 | 13.4101 | 0.442189 |

Source: own

In general, businesses should strive to increase profitability (return). The average return on assets in the rated set of businesses is low (Tab. 2), which we evaluate negatively. A minimum ROA of -119.2% indicates that the business is not able to generate new funds and make a profit. However, the maximum value is as much as 74.3%. The median return on assets indicates that half of the values in the sample are less than or equal to 2.8%, and at least half of the values are higher than or equal to 2.8%. It is the same with ROS. The equity ratio of businesses an average of 28.3% – businesses finance 28.3% of assets from their own capital. At least half of businesses have a value higher than or equal to 28.3%. With the debt ratio, we find that on average, companies finance up to 71.68% of assets from outside capital.

For the actual analysis of the position of businesses in the market, and also the acceptance/rejection of hypotheses, the methods of multicriterial evaluation were used.

Multicriterial methods for comparing businesses consist of choosing the most important indicators of financial and economic analysis, which plausibly represent the financial situation. Based on the indicators chosen, the analysis should provide a comprehensive view of the level of businesses using a single

synthesizing indicator. One of the goals of businesses is to make a profit through their activities. Profitability indicators enable a business to be economically efficient. The return on assets gives an idea of how well a business can convert the money it invests into net income. The higher the ROA, the business earns more, or the same from a smaller investment. The return on sales gives a picture not only about the efficiency of production and provision of services, but also about how management manages the business. The debt ratio gives a picture of the stability and independence of a business in the case of a high proportion of own capital and vice versa of volatility when outside capital predominate. Financial independence interprets the share of own capital in the company. Although outside capital is cheaper, too high a share can jeopardise the existence of the business.

Tab. 3 shows the results found using the simple unweighted rank method. Business No. 48 was ranked as the best, with 8.5 points. The first was mainly due to high ROA values (ranked seventh) and ROS (ranked second of all companies) as well as relatively low debt ratio, but only 17th in terms of financial independence (equity ratio).

The worst was company No. 9, which was mainly caused by the low values of ROA,

Tab. 3: The simple unweighted rank method – Part 1

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|-----|-----|----|----|-------|---------|-------|
| 1 | 1 | 16 | 22 | 19 | 58 | 14.50 | 10 |
| 2 | 40 | 48 | 46 | 50 | 184 | 46.00 | 49 |
| 3 | 18 | 13 | 19 | 18 | 68 | 17.00 | 16 |
| 4 | 24 | 25 | 15 | 29 | 93 | 23.25 | 23 |
| 5 | 6 | 8 | 11 | 13 | 38 | 9.50 | 2 |
| 6 | 10 | 6 | 13 | 10 | 39 | 9.75 | 3 |
| 7 | 37 | 38 | 36 | 39 | 150 | 37.50 | 38 |
| 8 | 16 | 10 | 27 | 9 | 62 | 15.50 | 13 |
| 9 | 49 | 46 | 44 | 48 | 187 | 46.75 | 50 |
| 10 | 19 | 27 | 25 | 27 | 98 | 24.50 | 25 |
| 11 | 32 | 33 | 6 | 35 | 106 | 26.50 | 30 |
| 12 | 48 | 43 | 43 | 47 | 181 | 45.25 | 48 |
| 13 | 41 | 36 | 35 | 38 | 150 | 37.50 | 39 |
| 14 | 4 | 15 | 7 | 21 | 47 | 11.75 | 6 |
| 15 | 21 | 22 | 42 | 16 | 101 | 25.25 | 29 |
| 16 | 36 | 39 | 49 | 49 | 173 | 43.25 | 45 |
| 17 | 50 | 44 | 50 | 1 | 145 | 36.25 | 37 |
| 18 | 46 | 42 | 45 | 45 | 178 | 44.50 | 46 |
| 19 | 44 | 41 | 47 | 46 | 178 | 44.50 | 47 |
| 20 | 26 | 4 | 4 | 15 | 49 | 12.25 | 8 |
| 21 | 11 | 9 | 32 | 6 | 58 | 14.50 | 11 |
| 22 | 27 | 28 | 41 | 17 | 113 | 28.25 | 33 |
| 23 | 35 | 35 | 48 | 23 | 141 | 35.25 | 36 |
| 24 | 12 | 11 | 1 | 22 | 46 | 11.50 | 4 |
| 25 | 33 | 24 | 10 | 30 | 97 | 24.25 | 24 |
| 26 | 25 | 14 | 31 | 11 | 81 | 20.25 | 20 |
| 27 | 45 | 40 | 37 | 40 | 162 | 40.50 | 44 |
| 28 | 22 | 26 | 5 | 33 | 86 | 21.50 | 22 |
| 29 | 47 | 45 | 20 | 41 | 153 | 38.25 | 41 |
| 30 | 20 | 21 | 12 | 26 | 79 | 19.75 | 19 |
| 31 | 8 | 17 | 40 | 7 | 72 | 18.00 | 18 |
| 32 | 29 | 18 | 16 | 20 | 83 | 20.75 | 21 |
| 33 | 28 | 29 | 23 | 31 | 111 | 27.75 | 32 |
| 34 | 5 | 19 | 30 | 14 | 68 | 17.00 | 17 |
| 35 | 23 | 31 | 14 | 32 | 100 | 25.00 | 28 |
| 36 | 3 | 32 | 39 | 24 | 98 | 24.50 | 26 |

Tab. 3: The simple unweighted rank method – Part 2

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|-----|-----|----|----|-------|---------|-------|
| 37 | 15 | 7 | 34 | 5 | 61 | 15.25 | 12 |
| 38 | 31 | 30 | 3 | 34 | 98 | 24.50 | 27 |
| 39 | 42 | 49 | 18 | 42 | 151 | 37.75 | 40 |
| 40 | 17 | 12 | 26 | 12 | 67 | 16.75 | 15 |
| 41 | 34 | 34 | 9 | 36 | 113 | 28.25 | 34 |
| 42 | 13 | 20 | 2 | 28 | 63 | 15.75 | 14 |
| 43 | 39 | 47 | 24 | 44 | 154 | 38.50 | 42 |
| 44 | 9 | 1 | 33 | 3 | 46 | 11.50 | 5 |
| 45 | 30 | 23 | 28 | 25 | 106 | 26.50 | 31 |
| 46 | 2 | 5 | 38 | 2 | 47 | 11.75 | 7 |
| 47 | 43 | 50 | 21 | 43 | 157 | 39.25 | 43 |
| 48 | 7 | 2 | 17 | 8 | 34 | 8.50 | 1 |
| 49 | 38 | 37 | 8 | 37 | 120 | 30.00 | 35 |
| 50 | 14 | 3 | 29 | 4 | 50 | 12.50 | 9 |

Source: own

ROS and at the same time the high debt ratio of the business (in the evaluated indicators it took 44–49th place). The best ROA value was achieved by the company No. 1, however, was only 10th in the overall ranking, which means that the management of this company converts well the invested money. However, in terms of ROS, it is only in 16th place, which means that in the analyzed set of companies it is average in terms of efficiency of service provision. The best value of ROS has the company No. 44, but for

this company its ranking is reduced by the poor value of the financial independence indicator. However, we note here that this method does not take into account the depth of differences between intercompany comparisons, so the results may be skewed.

According to the scoring method (Tab. 4), the best results were achieved by business No. 20. This company has a high equity ratio and very low debt ratio. It also achieved very good scoring with the ROS indicator. This means that

Tab. 4: The scoring method – Part 1

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|----------|----------|----------|----------|----------|--------------|-------|
| 1 | 100 | 29.83792 | 36.35143 | -3.36093 | 162.8284 | 40.707105 | 4 |
| 2 | -3.69797 | -117.801 | 4.823477 | 100 | -16.6752 | -4.168803806 | 43 |
| 3 | 13.48511 | 33.12818 | 39.20614 | -3.45984 | 82.3596 | 20.58989995 | 20 |
| 4 | 3.953208 | 7.733802 | 41.24126 | -0.76784 | 52.16042 | 13.0401055 | 27 |
| 5 | 41.50786 | 64.82934 | 45.30461 | -5.85924 | 145.7826 | 36.44564351 | 6 |
| 6 | 24.69466 | 72.75895 | 43.83114 | -6.79698 | 134.4878 | 33.62194132 | 7 |
| 7 | -1.82905 | -14.799 | 14.10357 | 4.296514 | 1.772009 | 0.443002234 | 39 |
| 8 | 14.29842 | 55.47763 | 27.78232 | -8.17639 | 89.38198 | 22.34549489 | 15 |

Tab. 4: The scoring method – Part 2

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|----------|----------|----------|----------|----------|--------------|-------|
| 9 | -64.2432 | -117.025 | 6.743349 | 71.05831 | -103.466 | -25.86659718 | 49 |
| 10 | 8.273401 | 7.61559 | 29.99929 | -1.03945 | 44.84883 | 11.21220808 | 32 |
| 11 | 1.665225 | 4.925494 | 77.76612 | -0.25934 | 84.0975 | 21.02437387 | 18 |
| 12 | -39.9396 | -60.008 | 7.213809 | 34.06093 | -58.6728 | -14.66820526 | 44 |
| 13 | -3.86333 | -9.64648 | 16.52858 | 2.389713 | 5.408478 | 1.352119495 | 37 |
| 14 | 55.92763 | 31.0669 | 48.8625 | -2.60336 | 133.2537 | 33.31341689 | 10 |
| 15 | 7.173612 | 8.551699 | 8.54879 | -4.096 | 20.1781 | 5.044525184 | 35 |
| 16 | -1.24014 | -16.3184 | 0.848678 | 78.73125 | 62.02139 | 15.50534628 | 25 |
| 17 | -160.355 | -61.7517 | -7.22944 | -34.9749 | -264.311 | -66.07776478 | 50 |
| 18 | -8.57963 | -31.6054 | 5.376414 | 24.07028 | -10.7384 | -2.684589515 | 42 |
| 19 | -4.88015 | -26.2138 | 4.329456 | 24.79186 | -1.97264 | -0.493160692 | 40 |
| 20 | 3.759089 | 90.86449 | 89.74871 | -4.14551 | 180.2268 | 45.05669317 | 1 |
| 21 | 21.21656 | 61.36323 | 17.67853 | -14.2126 | 86.0457 | 21.5114243 | 17 |
| 22 | 3.658313 | 7.510712 | 8.592785 | -3.57898 | 16.18283 | 4.045707172 | 36 |
| 23 | 0.744292 | 1.179993 | 2.426193 | -1.99144 | 2.359042 | 0.589760391 | 38 |
| 24 | 19.44742 | 52.69424 | 100 | -2.15762 | 169.984 | 42.4960106 | 2 |
| 25 | 1.541231 | 8.309391 | 45.32652 | -0.75064 | 54.42651 | 13.60662741 | 26 |
| 26 | 3.875971 | 32.05174 | 19.5104 | -6.72663 | 48.71148 | 12.17786947 | 29 |
| 27 | -6.90479 | -20.7215 | 13.5089 | 6.280778 | -7.83661 | -1.959153017 | 41 |
| 28 | 5.946327 | 7.617378 | 78.42051 | -0.39773 | 91.58649 | 22.89662216 | 14 |
| 29 | -9.12297 | -100.732 | 37.8081 | 10.90924 | -61.1376 | -15.28439359 | 45 |
| 30 | 8.257714 | 12.03546 | 44.68884 | -1.10275 | 63.87926 | 15.96981537 | 24 |
| 31 | 40.12582 | 29.73106 | 9.854115 | -12.3539 | 67.35707 | 16.8392668 | 23 |
| 32 | 3.457291 | 29.08537 | 40.98033 | -2.90611 | 70.61689 | 17.65422196 | 22 |
| 33 | 3.482237 | 6.458503 | 36.12806 | -0.73198 | 45.33682 | 11.33420448 | 31 |
| 34 | 52.96127 | 27.60689 | 19.65648 | -5.75074 | 94.4739 | 23.61847532 | 13 |
| 35 | 5.053736 | 5.716212 | 41.32594 | -0.56637 | 51.52952 | 12.88237921 | 28 |
| 36 | 69.35211 | 5.205858 | 11.37326 | -1.87422 | 84.05701 | 21.01425316 | 19 |
| 37 | 14.57134 | 71.55327 | 17.53718 | -16.7064 | 86.95543 | 21.73885665 | 16 |
| 38 | 1.824744 | 6.235705 | 91.51943 | -0.27899 | 99.30089 | 24.82522313 | 12 |
| 39 | -3.86589 | -119.861 | 39.24088 | 12.50692 | -71.9788 | -17.99470995 | 46 |
| 40 | 13.70862 | 42.29531 | 27.8643 | -6.21522 | 77.65301 | 19.413252 | 21 |
| 41 | 1.307696 | 1.51039 | 45.62324 | -0.13555 | 48.30577 | 12.07644184 | 30 |
| 42 | 16.2069 | 22.34273 | 95.76846 | -0.95527 | 133.3628 | 33.34070378 | 9 |
| 43 | -3.04274 | -117.04 | 31.69489 | 15.12013 | -73.2673 | -18.31681422 | 47 |
| 44 | 39.81995 | 100 | 17.54589 | -23.3366 | 134.0293 | 33.50731858 | 8 |

Tab. 4: The scoring method – Part 3

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|----------|----------|----------|----------|----------|--------------|-------|
| 45 | 3.315763 | 8.500723 | 24.1396 | -1.44191 | 34.51418 | 8.628544967 | 33 |
| 46 | 86.96771 | 80.84154 | 11.88669 | -27.8475 | 151.8485 | 37.96211695 | 5 |
| 47 | -4.63529 | -126.219 | 37.71372 | 13.70368 | -79.4368 | -19.85919991 | 48 |
| 48 | 41.05157 | 92.69448 | 40.74882 | -9.31432 | 165.1806 | 41.29513816 | 3 |
| 49 | -2.36188 | -13.5692 | 47.80855 | 1.162148 | 33.0396 | 8.259900942 | 34 |
| 50 | 15.33414 | 92.19773 | 20.48576 | -18.4281 | 109.5895 | 27.39738326 | 11 |

Source: own

this company is stable and independent, mainly due to the higher share of own resources in the company's assets. The high value of ROS testifies to the proper management of the business by the management. The worst is business No. 17 (it has significantly negative

values). The ROA indicator has the worst score, the efficiency of the invested capital is very low. The most points for the ROA indicator was obtained by the company No. 1, for the ROS indicator enterprise No. 44, as in the previous method.

Tab. 5: Standardized variable method – Part 1

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|----------|----------|----------|----------|----------|-------------|-------|
| 1 | 2.48986 | 0.423511 | 0.153491 | -0.27865 | 2.788216 | 0.697054098 | 3 |
| 2 | -0.33465 | -2.11064 | -1.06036 | 4.061144 | 0.555491 | 0.138872676 | 18 |
| 3 | 0.133384 | 0.479987 | 0.263401 | -0.2828 | 0.593972 | 0.14849304 | 17 |
| 4 | -0.12624 | 0.044104 | 0.341754 | -0.16977 | 0.089842 | 0.022460483 | 27 |
| 5 | 0.896662 | 1.024124 | 0.498197 | -0.38354 | 2.035441 | 0.508860296 | 7 |
| 6 | 0.438707 | 1.160233 | 0.441467 | -0.42292 | 1.617492 | 0.404372964 | 9 |
| 7 | -0.28374 | -0.34266 | -0.70307 | 0.042864 | -1.28661 | -0.32165272 | 40 |
| 8 | 0.155537 | 0.863606 | -0.17643 | -0.48083 | 0.361883 | 0.090470764 | 20 |
| 9 | -1.98376 | -2.09733 | -0.98645 | 2.845976 | -2.22156 | -0.55539053 | 49 |
| 10 | -0.00857 | 0.042074 | -0.09107 | -0.18118 | -0.23874 | -0.05968612 | 32 |
| 11 | -0.18856 | -0.0041 | 1.747996 | -0.14842 | 1.40691 | 0.351727614 | 11 |
| 12 | -1.32179 | -1.11866 | -0.96833 | 1.292576 | -2.1162 | -0.52905047 | 48 |
| 13 | -0.33915 | -0.25422 | -0.60971 | -0.0372 | -1.24027 | -0.31006854 | 38 |
| 14 | 1.289425 | 0.444606 | 0.635179 | -0.24684 | 2.122372 | 0.530592975 | 6 |
| 15 | -0.03853 | 0.058142 | -0.91694 | -0.30951 | -1.20683 | -0.30170784 | 37 |
| 16 | -0.2677 | -0.36874 | -1.2134 | 3.168138 | 1.318298 | 0.329574568 | 13 |
| 17 | -4.60164 | -1.4859 | -1.52441 | -1.60601 | -8.88066 | -2.22016382 | 50 |
| 18 | -0.46761 | -0.63114 | -1.03908 | 0.873101 | -1.26472 | -0.31618095 | 39 |
| 19 | -0.36685 | -0.53859 | -1.07938 | 0.903398 | -1.08143 | -0.27035628 | 36 |
| 20 | -0.13153 | 1.471007 | 2.209337 | -0.31159 | 3.237222 | 0.809305593 | 2 |

Tab. 5: Standardized variable method – Part 2

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|----------|----------|----------|----------|----------|-------------|-------|
| 21 | 0.343972 | 0.96463 | -0.56543 | -0.73427 | 0.008895 | 0.002223684 | 28 |
| 22 | -0.13428 | 0.040274 | -0.91524 | -0.2878 | -1.29705 | -0.32426168 | 41 |
| 23 | -0.21365 | -0.06839 | -1.15266 | -0.22115 | -1.65585 | -0.41396151 | 43 |
| 24 | 0.295784 | 0.81583 | 2.604021 | -0.22812 | 3.487512 | 0.871877885 | 1 |
| 25 | -0.19194 | 0.053983 | 0.499041 | -0.16905 | 0.192034 | 0.048008452 | 24 |
| 26 | -0.12835 | 0.461511 | -0.4949 | -0.41996 | -0.5817 | -0.14542579 | 34 |
| 27 | -0.42199 | -0.44432 | -0.72597 | 0.126177 | -1.4661 | -0.36652555 | 42 |
| 28 | -0.07196 | 0.042105 | 1.773191 | -0.15423 | 1.589108 | 0.397276934 | 10 |
| 29 | -0.48241 | -1.81767 | 0.209575 | 0.320512 | -1.76999 | -0.44249747 | 44 |
| 30 | -0.009 | 0.11794 | 0.47449 | -0.18383 | 0.399597 | 0.099899239 | 19 |
| 31 | 0.859018 | 0.421677 | -0.86668 | -0.65623 | -0.24222 | -0.06055446 | 33 |
| 32 | -0.13975 | 0.410594 | 0.331709 | -0.25955 | 0.343 | 0.085750113 | 21 |
| 33 | -0.13907 | 0.022214 | 0.144892 | -0.16827 | -0.14023 | -0.03505833 | 31 |
| 34 | 1.208628 | 0.385217 | -0.48928 | -0.37899 | 0.725578 | 0.181394523 | 15 |
| 35 | -0.09627 | 0.009472 | 0.345015 | -0.16131 | 0.096906 | 0.024226615 | 26 |
| 36 | 1.655079 | 0.000712 | -0.80819 | -0.21622 | 0.631375 | 0.157843858 | 16 |
| 37 | 0.16297 | 1.139538 | -0.57087 | -0.3898 | -0.10734 | -0.02683623 | 29 |
| 38 | -0.18422 | 0.018389 | 2.277511 | -0.4925 | 1.962435 | 0.490608776 | 8 |
| 39 | -0.33922 | -2.146 | 0.264738 | 0.387593 | -1.83289 | -0.45822289 | 45 |
| 40 | 0.139472 | 0.637337 | -0.17327 | -0.39849 | 0.205049 | 0.051262165 | 23 |
| 41 | -0.1983 | -0.06272 | 0.510465 | -0.14322 | 0.10622 | 0.026554957 | 25 |
| 42 | 0.207519 | 0.29486 | 2.441103 | -0.17764 | 2.76584 | 0.691460098 | 4 |
| 43 | -0.3168 | -2.09758 | -0.02579 | 0.97313 | -1.94285 | -0.48571332 | 46 |
| 44 | 0.850687 | 1.627814 | -0.57054 | -1.11736 | 0.790603 | 0.197650683 | 14 |
| 45 | -0.14361 | 0.057267 | -0.31668 | -0.19807 | -0.60109 | -0.15027204 | 35 |
| 46 | 2.134889 | 1.298967 | -0.78842 | -1.30676 | 1.338675 | 0.334668756 | 12 |
| 47 | -0.36018 | -2.25514 | 0.205941 | 0.437841 | -1.97153 | -0.49288312 | 47 |
| 48 | 0.884234 | 1.502418 | 0.322795 | -0.52861 | 2.180836 | 0.545209102 | 5 |
| 49 | -0.29825 | -0.32155 | 0.594601 | -0.08874 | -0.11394 | -0.02848588 | 30 |
| 50 | 0.183747 | 1.493891 | -0.45735 | -0.91127 | 0.309019 | 0.077254629 | 22 |

Source: own

Using the standardized variable method (Tab. 5), we find that the best business now is No. 24 (it achieved the highest value for the indicator, 0.872), has a highly rated financial stability and ROS. Company No. 20 moved up to second place. Even according to this method,

the worst was again company No. 17, due to poor evaluation of all indicators, especially ROA, as in the previous method.

We also ranked the businesses using the distance from the fictional point method (Tab. 6). The lower the value of the integral indicator, the

Tab. 6: Fictional point method – Part 1

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|-------------|----------|----------|----------|----------|-------------|-------|
| 1 | 0 | 0.170314 | 0.346557 | 0.187718 | 0.704589 | 0.176147349 | 4 |
| 2 | 0.399445514 | 0.528698 | 0.518222 | 0.801457 | 2.247823 | 0.561955678 | 49 |
| 3 | 0.33325612 | 0.162327 | 0.331014 | 0.187131 | 1.013728 | 0.253431948 | 19 |
| 4 | 0.369973097 | 0.22397 | 0.319933 | 0.203115 | 1.116992 | 0.279247935 | 26 |
| 5 | 0.225312225 | 0.085375 | 0.297808 | 0.172884 | 0.781379 | 0.195344701 | 8 |
| 6 | 0.290076857 | 0.066126 | 0.305831 | 0.167315 | 0.82935 | 0.207337382 | 10 |
| 7 | 0.392246418 | 0.278667 | 0.467694 | 0.233187 | 1.371794 | 0.342948528 | 38 |
| 8 | 0.330123239 | 0.108075 | 0.393215 | 0.159125 | 0.990538 | 0.247634503 | 18 |
| 9 | 0.632666081 | 0.526814 | 0.507769 | 0.629607 | 2.296856 | 0.574213972 | 50 |
| 10 | 0.353331675 | 0.224257 | 0.381144 | 0.201503 | 1.160235 | 0.290058838 | 31 |
| 11 | 0.378786428 | 0.230787 | 0.12106 | 0.206135 | 0.936769 | 0.234192233 | 14 |
| 12 | 0.539048569 | 0.388409 | 0.505207 | 0.409923 | 1.842588 | 0.460646943 | 46 |
| 13 | 0.400082487 | 0.26616 | 0.45449 | 0.221864 | 1.342597 | 0.335649153 | 36 |
| 14 | 0.16976715 | 0.167331 | 0.278436 | 0.192216 | 0.807751 | 0.201937659 | 9 |
| 15 | 0.357568069 | 0.221985 | 0.497938 | 0.183353 | 1.260845 | 0.315211255 | 34 |
| 16 | 0.389977899 | 0.282356 | 0.539864 | 0.675167 | 1.887365 | 0.471841291 | 47 |
| 17 | 1.002890069 | 0.392642 | 0.583849 | 0 | 1.979381 | 0.494845197 | 48 |
| 18 | 0.418249712 | 0.319464 | 0.515212 | 0.3506 | 1.603525 | 0.400881283 | 45 |
| 19 | 0.403999252 | 0.306376 | 0.520912 | 0.354884 | 1.586172 | 0.396543017 | 43 |
| 20 | 0.370720843 | 0.022176 | 0.055817 | 0.183059 | 0.631773 | 0.157943232 | 3 |
| 21 | 0.303474493 | 0.093788 | 0.448228 | 0.123283 | 0.968774 | 0.242193474 | 17 |
| 22 | 0.371109032 | 0.224512 | 0.497699 | 0.186423 | 1.279743 | 0.319935834 | 35 |
| 23 | 0.382333867 | 0.239879 | 0.531275 | 0.19585 | 1.349338 | 0.33733459 | 37 |
| 24 | 0.31028924 | 0.114832 | 0 | 0.194863 | 0.619984 | 0.154996046 | 2 |
| 25 | 0.379264053 | 0.222573 | 0.297689 | 0.203218 | 1.102744 | 0.275686 | 25 |
| 26 | 0.370270612 | 0.16494 | 0.438254 | 0.167733 | 1.141198 | 0.285299521 | 29 |
| 27 | 0.411798212 | 0.293044 | 0.470931 | 0.244969 | 1.420742 | 0.355185611 | 39 |
| 28 | 0.362295585 | 0.224253 | 0.117497 | 0.205313 | 0.909359 | 0.227339724 | 13 |
| 29 | 0.42034264 | 0.487264 | 0.338626 | 0.272452 | 1.518685 | 0.379671175 | 40 |
| 30 | 0.353392101 | 0.213528 | 0.301161 | 0.201127 | 1.069209 | 0.267302146 | 24 |
| 31 | 0.23063588 | 0.170573 | 0.490831 | 0.134319 | 1.02636 | 0.256589954 | 20 |
| 32 | 0.37188337 | 0.172141 | 0.321353 | 0.190419 | 1.055796 | 0.263949122 | 23 |
| 33 | 0.37178728 | 0.227066 | 0.347773 | 0.203328 | 1.149955 | 0.287488802 | 30 |
| 34 | 0.181193598 | 0.17573 | 0.437459 | 0.173528 | 0.96791 | 0.241977483 | 16 |
| 35 | 0.365733853 | 0.228868 | 0.319472 | 0.204312 | 1.118385 | 0.279596337 | 27 |
| 36 | 0.118055931 | 0.230107 | 0.48256 | 0.196546 | 1.027268 | 0.256817114 | 21 |

Tab. 6: Fictional point method – Part 2

| Business | ROA | ROS | ER | DR | Total | Average | Order |
|----------|-------------|----------|----------|----------|----------|-------------|-------|
| 37 | 0.329071955 | 0.069053 | 0.448998 | 0.108475 | 0.955598 | 0.23889948 | 15 |
| 38 | 0.378171957 | 0.227607 | 0.046175 | 0.206018 | 0.857973 | 0.214493144 | 11 |
| 39 | 0.400092332 | 0.533698 | 0.330825 | 0.281939 | 1.546554 | 0.386638459 | 41 |
| 40 | 0.332395169 | 0.140075 | 0.392768 | 0.17077 | 1.036008 | 0.259001985 | 22 |
| 41 | 0.380163633 | 0.239077 | 0.296074 | 0.20687 | 1.122184 | 0.280546102 | 28 |
| 42 | 0.322771781 | 0.188508 | 0.02304 | 0.202003 | 0.736323 | 0.184080654 | 6 |
| 43 | 0.39692155 | 0.52685 | 0.371911 | 0.297455 | 1.593138 | 0.398284579 | 44 |
| 44 | 0.231814102 | 0 | 0.448951 | 0.069106 | 0.749871 | 0.187467754 | 7 |
| 45 | 0.372428541 | 0.222109 | 0.413049 | 0.199113 | 1.206699 | 0.301674764 | 33 |
| 46 | 0.050200484 | 0.046506 | 0.479764 | 0.042321 | 0.618792 | 0.154697968 | 1 |
| 47 | 0.40305606 | 0.549132 | 0.33914 | 0.289045 | 1.580373 | 0.395093231 | 42 |
| 48 | 0.227069861 | 0.017734 | 0.322614 | 0.152368 | 0.719786 | 0.179946384 | 5 |
| 49 | 0.394298858 | 0.275682 | 0.284175 | 0.214575 | 1.168731 | 0.292182819 | 32 |
| 50 | 0.326133642 | 0.01894 | 0.432943 | 0.098252 | 0.876269 | 0.219067137 | 12 |

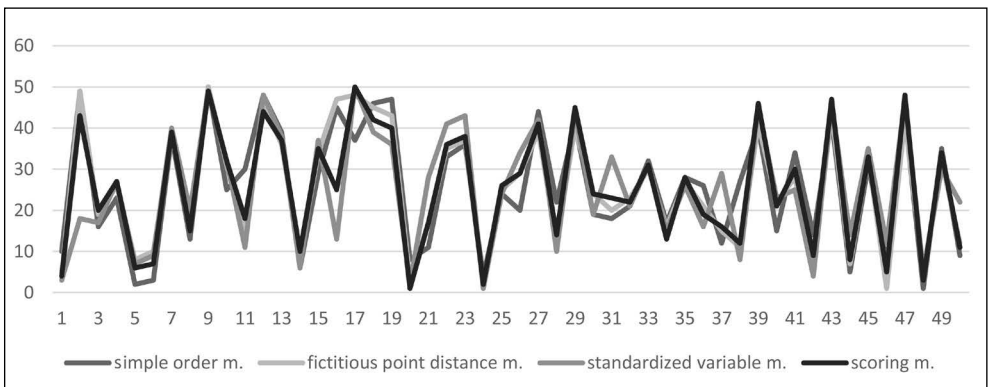
Source: own

better the business is, since it is closer to the fictional best business. The fictional business is that achieves the best values for the relative indicators. No. 46 (with a value of indicator 0.155) was ranked as the best, company No. 24 moved up to second place, company No. 20 came in third place. The worst is now company No. 9 highest value of the indicator (0.574).

The results in the tables provide basic information in each indicator individually. The object placed in the individual order signals weaknesses or advantages, whether in the return on assets, sales, debt ratio and equity ratio.

Fig. 1 shows a mutual comparison of the methods used, it is a graphical representation of the similarity between the methods compared.

Fig. 1: Comparison of methods



Source: own

Tab. 7: Spearman rank correlations

| | Scoring method | Fictional point method | Simple unweighted rank method | Standardized variable method |
|-------------------------------|----------------|------------------------|-------------------------------|------------------------------|
| Scoring method | | 0.9632 | 0.9105 | 0.9157 |
| | | (50) | (50) | (50) |
| | | 0.0000 | 0.0000 | 0.0000 |
| Fictional point method | 0.9632 | | 0.9296 | 0.8424 |
| | (50) | | (50) | (50) |
| | 0.0000 | | 0.0000 | 0.0000 |
| Simple unweighted rank method | 0.9105 | 0.9296 | | 0.7408 |
| | (50) | (50) | | (50) |
| | 0.0000 | 0.0000 | | 0.0000 |
| Standardized variable method | 0.9157 | 0.8424 | 0.7408 | |
| | (50) | (50) | (50) | |
| | 0.0000 | 0.0000 | 0.0000 | |

Source: own

Relatively identical results were provided for all of these.

Correlation analysis (Tab. 7) found a strong correlation relationship between all methods used, because the correlation values are high, for example, between the scoring method and the distance from the fictional point method is 0.9632, between the scoring method and the simple unweighted rank method 0.9105, between the scoring method and the standardized variable method 0.9157, between the distance from the fictional point method and the simple order method 0.9296, between the distance from the fictional point method and the standardised variable method 0.8424 and between the simple unweighted rank method and the standardised variable method 0.7408. This means that the weakest correlation is between the standardized variable method and the simple unweighted rank method. The strongest relationship is between the scoring method and the distance from the fictional point method. However, in all cases, by statistical calculation, we found that there is a strong statistically proven relationship between all the methods used, since the p-value is 0.000, which is less than 0.001. This means that it is 99.99% statistically proven.

Such a study has not yet been carried out in our chosen sector. However, similar studies

have been carried out in other sectors. All these studies show a high agreement of the intercompany comparison methods used. The strongest agreement is between the scoring method and the distance from the fictional point method.

3.1 Evaluation of Hypotheses and Research Questions

From the previous analysis, the order created according to the method of distance from the fictional point is used as representative below. Based on this, the established hypotheses are evaluated.

H1: Businesses with a low equity ratio are found in the bottom ten in the evaluated sample of businesses.

The equity ratio in these ten businesses is very low, well below the required values. On average, it is 11.4%. The maximum is 34.33%, but the median is 0.05301. This means that half of these businesses have an equity ratio of less than 5.3%.

We confirm this hypothesis.

H2: Businesses with a high level of indebtedness are found in the bottom 10 in the evaluated sample of businesses.

Businesses in the last ten had debt ratio values in the range of 65.67% to 106% (for a loss-making business). On average, it is

Tab. 8: Ten worst companies

| Business | Serial No. of the business from the set of businesses | ER | DR |
|----------|---|----------|----------|
| 1 | 39 | 0.343268 | 0.656732 |
| 2 | 47 | 0.329909 | 0.670091 |
| 3 | 19 | 0.037873 | 0.962127 |
| 4 | 43 | 0.277258 | 0.722742 |
| 5 | 18 | 0.047031 | 0.952969 |
| 6 | 12 | 0.063104 | 0.936896 |
| 7 | 16 | 0.007424 | 0.992576 |
| 8 | 17 | -0.06324 | 1.063241 |
| 9 | 2 | 0.042194 | 0.957806 |
| 10 | 9 | 0.058989 | 0.941011 |

Source: own

88.56%. The recommended value of this indicator is 50%. The median is 0.94698. This means that half of these 10 businesses have a total debt of more than 94.7%.

We confirm this hypothesis.

RQ1: How do food retail businesses prosper?

In terms of the evaluation of the ROA indicator, the evaluated companies do not reach the average value of the indicator in the Slovak Republic. The indicator evaluates the return on net profit from € 1 of assets. The best company reaches a value of only 0.74. The average value in the analysed set of companies is only 0.06. The highest ROS value is 0.15. The average value of total debt in the Slovak Republic is 68.58%. The average indebtedness in our analysed group is slightly higher – 71.69%.

RQ2: Do all multicriteria evaluation methods lead to the same results?

Yes, the correlation analysis revealed a strong correlation between all the methods used, because the correlation values are high. In all cases, we found by statistical calculation that there is a strong statistically significant relationship between all the methods used.

RQ3: Does the degree of debt of the business affect its financial health?

RQ4: Are financially dependent businesses one of the worst businesses in the industry?

Yes, for all methods, we found that the company that was rated as the best showed low overall indebtedness and a high degree

of financial independence. And vice versa, the companies that were rated as the worst showed a high overall debt.

Conclusion

The market position of businesses was analysed using multicriterial methods. 4 ratio-based financial analysis indicators were selected as representative. From the group of profitability indicators, ROA – return on assets and ROS – return on sales were chosen. For debt indicators the equity ratio and the debt ratio were selected. There are several reasons for choosing these indicators. The aim of each company should be to increase profitability. In the set of businesses we analysed, 30% of businesses had negative ROA and ROS ratios (on average for the whole set, ROA is 0.063, ROS is 0.0079). The average value for ROA for the whole of the Slovak Republic is 1.89. In the set of businesses evaluated, the best value is 0.74.

The lowest value for the debt ratio in the monitored sample of businesses is 12.5%. In the group of the worst performing companies, the debt ratio climbed far above the recommended values of 50–70%. The extreme value was a debt ratio as high as 106.3%.

In the case of the equity ratio, it is recommended for outside capital not to exceed the shareholder's equity. Up to half of businesses record a value for this indicator of lower than 25.3%, which speaks to the financial

dependence of the business. In terms of the worst businesses, the average equity ratio is only 11.4%.

The impact of indicators ranks businesses from best to worst using the simple unweighted rank method, the scoring method, the distance from the fictional point method, and the standardized variable method. We showed the correlations of the methods using Spearman's rank correlation coefficient.

We found the highest correlation in values between the scoring method and the distance from the fictional point method. However, in all cases, by statistical calculation, we found that there is a strong statistically proven relationship between all the methods used, since the p-value is 0.000, which is less than 0.001. This means that it is statistically proven with 99.99% confidence.

The degree of indebtedness of a business significantly affects its financial health and the structure of the finances. While respecting the golden rule of financing, the recommended debt ratio should not exceed 50%. However, the value of this indicator may also be accepted in certain circumstances at 70–80%. The borrowing of outside finances can be considered economically advantageous when their economic profitability outweighs the difficulties caused by increasing the volume of outside capital. Debt, as a rule, is not always a negative feature of a business. When a company achieves a higher level of indebtedness, it is at a higher risk of doing business and acquiring outside capital (loans).

The best business ideas can generate a lot of returns and needs little capital to grow. But deciding where to spend the capital and where to deposit it is an important decision, especially in small and medium-sized businesses, because of the higher probability of bankruptcy. Spending cuts are a good way to increase cashflows for all businesses with problems, but also for stable ones. In the case of loans from multiple lenders, we recommend refinancing in order to obtain alternative conditions – the provision of a more favourable interest rate, lower repayments and the possibility of obtaining additional funds. We recommend deselecting current suppliers of goods that over-indebt the business, while looking for and reaching out to potential new ones who could provide quality goods at a lower price, or with lower shipping costs – if current suppliers provide too unfavourable

a shipping price, we recommend reaching out to a separate shipping service company. We also recommend reducing overheads by introducing savings measures.

By applying consumer psychology to business, we can create the conditions for more efficient operations and increased sales. We recommend focusing on increasing the levels of sales, revenue and profitability of products. Retail employees are those who are on the front line every day, whether communicating with or serving the customer. We suggest ensuring that employees are trained and professionally competent and polite to customers, and monitoring their productivity in the workplace and thereby increasing opportunities for sales. Increasing the prices of popular products and services can have a positive impact on revenues, although reducing them often helps attract new customers. Short-term reductions in product prices (seasonality, approaching expiry dates, grade II quality, multipacks in the case of surplus stocks) can have a positive impact on the consumer. However, care should also be taken that this does not have a very negative impact on sales. In the event of businesses that use only electronic cash registers when selling goods to the final consumer, we propose enabling customers to make payments in several ways – in addition to cash, to introduce payment using terminals, meal vouchers and cards. Due to high competition and increased competitiveness, we recommend the addition of new products and product lines to the company's range so as to bring the expected demand and profit. We consider the proposals we present to be universal, applicable in other countries in the given sector.

We suggest that smaller businesses consider joining the My Store shopping alliance. It brings together independent food and general merchandise retailers and is covered by METRO Cash & Carry. Thanks to the membership in the alliance, entrepreneurs will receive a support package based on the comprehensive identity of the store under the brand My shop, advantageous offer of goods and active business cooperation.

References

Alt, M. A., Berezvai, Z., & Agárdi, I. (2020). Harmony-oriented retail innovations and financial performance. *European Journal of*

Innovation Management, 24(4), 1379–1399. <https://doi.org/10.1108/EJIM-04-2020-0145>

Buele, I., Mora, A., & Santiago, S. (2021). Ecuadorian Wholesale and Retail Trade Companies: Analysis of the Financial Situation and Bankruptcy Forecast under Altman Z-score. *Academy of Accounting and Financial Studies Journal*, 25(1), 1–11.

Fenyves, V., & Tarnóczy, T. (2020). Data envelopment analysis for measuring performance in a competitive market. *Problems and Perspectives in Management*, 18(1), 315–325. [https://doi.org/10.21511/ppm.18\(1\).2020.27](https://doi.org/10.21511/ppm.18(1).2020.27)

Grau, A., & Reig, A. (2021). Operating leverage and profitability of SMEs: agri-food industry in Europe. *Small Business Economics*, 57(1), 221–242. <https://doi.org/10.1007/s11187-019-00294-y>

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate Data Analysis*. New York, NY: Macmillan Publishing Company.

Han, D., Wang, S., & Ping, A. (2021). Profit Prediction Based on Management Discussion and Analysis of Annual Report of Listed Companies. In *Proceeding from the ICIMTECH 21: The Sixth International Conference on Information Management and Technology* (pp. 1–8). <https://doi.org/10.1145/3465631.3465724>

Horváthová, J., Mokrišová, M., & Petruška, I. (2021). Selected Methods of Predicting Financial Health of Companies: Neural Networks Versus Discriminant Analysis. *Information*, 12(12), 505. <https://doi.org/10.3390/info12120505>

Hurbánková, L. (2019). Analysis of Slovakia Regions on the Basis of Living Indicators. In *Proceedings from the International Scientific Conference ECONOMIC AND SOCIAL POLICY: Economic and Social Challenges for European Economy* (pp. 247–260). Ostrava: PRIGO University. Retrieved from <https://sekarl.euba.sk/arl-eu/sk/csg/?repo=eurepo&key=99289555350>

Jencova, S., Petruska, I., & Lukacova, M. (2021). Relationship between ROA and Total Indebtedness by Threshold Regression Model. *Montenegrin Journal of Economics*, 17(2), 37–46. <https://doi.org/10.14254/1800-5845/2021.17-2.3>

Jenčová, S. (2016). *Finančno-ekonomická analýza podnikateľských subjektov [Financial and economic analysis of business entities]*. Prešov: BookMan.

Knapková, A., & Pavelková, D. (2017). *Finanční analýza, komplexní průvodce s příklady [Financial analysis, a comprehensive guide with examples]*. Prague: Grada Publishing.

Majernik, M., Majernik, S., Rusko, M., Ilko, J., Kollar, V., & Kralikova, R. (2020). Management with application of the financial analysis in the food industry in Slovakia. In *Proceedings of the 31st DAAAM International Symposium on Intelligent Manufacturing and Automation* (pp. 0348–0355). <https://doi.org/10.2507/31st.daaam.proceedings.049>

Majková, M. (2008). *Možnosti financovania malých a stredných podnikov v SR [Financing options for small and medium-sized enterprises in the Slovak Republic]*. Bratislava: Tribún.

Oreský, M., & Rehák, R. (2019). *Finančná a ekonomická analýza obchodného podniku [Financial and economic analysis of a business enterprise]*. Bratislava: Wolters Kluwer.

Penner, J. S. (2016). *Economics and Financial Management for Nurse and Nurses* (3rd ed.). New York, NY: Springer Publishing Company.

Růčková, P., & Škulářová, N. (2021). The determination of financial structure in agriculture, forestry and fishing industry in selected countries of Central and Eastern Europe. *E&M Economics and Management*, 24(3), 58–78. <https://doi.org/10.15240/TUL/001/2021-03-004>

Srebro, B., Mavrenski, B., Arsić, V. B., Knežević, S., Milašinović, M., & Travica, J. (2021). Bankruptcy Risk Prediction in Ensuring the Sustainable Operation of Agriculture Companies. *Sustainability*, 13(14), 7712. <https://doi.org/10.3390/su13147712>

Svatošová, V. (2021). Hodnocení současného ekonomického vývoje cukrovarnických podniků v České republice [Current economic development of sugar companies in Czech Republic]. *Listy Cukrovarnické a Řepařské*, 137(2), 73–78.

Svatošová, V. (2022). Vybrané bankrotní modely cukrovarnických společností v České republice [Selected bankruptcy models of sugar companies in Czech Republic]. *Listy Cukrovarnické a Řepařské*, 138(1), 25–31.

Tarighi, H., Appolloni, A., Shirzad, A., & Azad, A. (2022). Corporate Social Responsibility Disclosure (CSR) and Financial Distressed Risk (FDR): Does Institutional Ownership Matter? *Sustainability*, 14(2), 742. <https://doi.org/10.3390/su14020742>

Valaskova, K., Kliestik, T., & Gajdosikova, D. (2021). Distinctive determinants of financial indebtedness: Evidence from Slovak and Czech enterprises. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(3), 639–659. <https://doi.org/10.24136/eq.2021.023>

Wang, X., Luo, X., & Hu, Y. (2021). Enterprise Accounting and Financial Risk Analysis System Based on Decision Tree and SVM. In *Proceeding ICISCAE 2021: 2021 4th International Conference on Information Systems and Computer Aided Education* (pp. 2015–2018). <https://doi.org/10.1145/3482632.3484089>

Zalai, K. (2016) *Finančno-ekonomická analýza podnikov [Financial and economic*

analysis of companies] (9th ed.). Bratislava: Sprint 2.

Zielińska-Chmielewska, A., Kaźmierczyk, J., & Jaźwiński, I. (2022). Quantitative Research on Profitability Measures in the Polish Meat and Poultry Industries. *Agronomy*, 12(1), 92. <https://doi.org/10.3390/agronomy12010092>

Zielińska-Chmielewska, A., Mruk-Tomczak, D., & Wielicka-Regulska, A. (2021). Qualitative Research on Solving Difficulties in Maintaining Continuity of Food Supply Chain on the Meat Market during the COVID-19 Pandemic. *Energies*, 14(18), 5634. <https://doi.org/10.3390/en14185634>